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ABSTRACT

The organization of social studies classroom communication and the format for presenting such communication were investigated. High school students (n=282) were assigned to groups determined by the possible combinations of lesson organization, also referred to as lesson commonality (high versus medium versus low), method of reading (oral versus silent), and student ability level (above average versus average versus below average). After the students were presented an economics lesson, a test was administered to determine their comprehension of the lesson. The students who read the lesson silently scored significantly higher than students who received an oral presentation of the lesson. A significant interaction between lesson organization and student ability level indicated that highly organized lessons increased student learning under certain ability level conditions. These results are discussed in relation to previous pertinent research. (Author/LP)

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Lesson Commonality and Method of Reading: Effect on Achievement in Social Studies

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Abstract

High school students (n = 282) were assigned to groups determined by the possible combinations of lesson organization, also referred to as lesson commonality (high versus medium versus low), method of reading (oral versus silent), and student ability level (above average versus average versus below average). After the students were presented an economics lesson, a test was administered to determine their comprehension of the lesson. The students who read the lesson silently scored significantly higher than students who received an oral presentation of the lesson. A significant interaction between lesson organization and student ability level indicated that highly organized lessons increased student learning under certain ability level conditions. These results are discussed in relation to previous pertinent research.

Lesson Commonality and Method of Reading: Effect on Achievement in Social Studies

The research reported here investigates the organization of classroom communication and the format for presenting such communication. Student understanding of classroom communication is studied in terms of the degree to which the communication is organized, the way in which the communication is delivered (silent reading versus oral reading), and the ability level of the student. In this study, organization of classroom communication is referred to as lesson commonality.

Lesson Commonality

A growing body of research has focused on the structure or organization of classroom communication and its effect on student learning. Anderson (1969) initiated much of this research by defining a method by which the degree of lesson organization can be quantified. The method takes into account the way that concepts are introduced into a lesson and the way in which these concepts are repeated in subsequent portions of the lesson. Anderson referred to this quantification as lesson kinetic structure or as lesson commonality, and he defined commonaltiy ($\underline{B}_1$) as follows:

$$\underline{B}_1 = \frac{2\underline{n}_1}{\underline{n}_o + 2\underline{n}_1}$$

where $\underline{n}_1$ equals the number of concepts repeated in a pair of consecutive sentences and $\underline{n}_o$ equals the number of concepts in one or the other of a contiguous pair of sentences that are not repeated from one to the other.

Concrete examples concerning computation of $\underline{B}_1$ are presented later in this article. After each value of $\underline{B}_1$ is computed for each pair of consecutive sentences in the lesson, the mean for all the $\underline{B}_1$ values is defined to be the commonality of the lesson. Anderson (1970) suggested that lesson commonality of .50 or higher represents a lesson of high commonality (or a highly organized lesson), whereas a lesson commonality of approximately .30 or lower represents a lesson of relatively low commonality. Theoretically, a lesson could have a commonality of 1.00, but this would happen only if all sentences in the lesson discussed the same concepts and no new concepts were introduced after the first sentence. Such a lesson would be extremely redundant and it would involve very little content coverage. The lowest possible value for lesson commonality is 0.00, and this would happen only if no two consecutive sentences focused on the same concept, each sentence discussing concepts different from the concepts in the preceding sentence. Such a lesson could be difficult to follow since students might have trouble arranging ideas in a logical sequence.

Research has reported a positive relationship between the degree of lesson commonality and student achievement in science classrooms (e.g., Anderson, 1967, 1969, 1970, 1974; Trindade, 1972; Browne & Anderson, 1974; Anderson & Lee, 1975; Ferraro, Lee, & Anderson, 1977; Simmons, 1977). Smith and Sanders (1981) reported similar results for fifth grade social studies students. A search of the literature revealed that no studies have been reported concerning lesson commonality in secondary school social studies classrooms.

Oral and Silent Reading

To date, only one research study has examined the effects of lesson commonality on material the students read silently, rather than being presented the content orally by the teacher. This study reported that secondary school mathematics students were better able to apply geometry theorems to solve specific problems when the material they read had a high degree of commonality rather than a low degree of commonality (Smith & Hodgin, in press). All other studies on commonality have been based on classrooms in which the material was presented orally to the students.

Research on comprehension of material presented orally versus comprehension of material read silently has produced contradictory results. For example, Negin and Rios (1980) reported that tenth graders in a developmental reading class comprehended more when the material was read orally than when it was read silently. Rowell (1976) reported similar results for elementary school students, and Collins (1961) published the same findings for college students. On the other hand, research such as that of Gray (1958) and Poulton and Brown (1967) has found no significant differences between oral comprehension and silent comprehension. Juel and Holmes (1981) suggested that one explanation for these seemingly contradictory results is that the ability level of the students is an important determinant of the ways in which these students decode information. Therefore, the purpose of the present study was to examine the combined effects of lesson commonality (high vs. medium vs. low), method of reading presentation (oral vs. silent), and student ability level (above average vs. average vs. below average) on student comprehension of social studies material.

Method

Subjects

The subjects were 282 students enrolled in Richmond County and Columbia County (Georgia) public secondary schools. Females comprised 57% of the sample and 64% of the students were of Caucasian ancestry. To determine ability levels of the students, a tape recorded lesson on the Baltic States, based on an article in the Atlantic Monthly (Atwood, 1980), was presented to the students in their regularly scheduled social studies classrooms. After the lesson, the students were given a 16-item test on the historical, geographic, and demographic characteristics of the Baltic States. The Kuder-Richardson formula 20 reliability of this test was .78. A total of 84 of the 282 students scored 15 or 16 correct responses on the test, and were classified as being in the above average group in terms of their ability to comprehend basic social studies concepts presented in the Baltic States material. Eighty-four students obtained from 12 to 14 correct responses on the test, and they were classified as being in the average ability group. The remaining 114 students scored fewer than 12 correct responses on the Baltic States test, and these students were classified as being in the below average ability group. Within the three ability groups, students were each randomly assigned to one of six groups formed by possible combinations of three lesson commonality conditions (high, medium, low) and two presentation conditions (oral reading, silent reading). Thus, the above average ability group and the average group had 14 representatives in each of the six conditions. The below average

group had 19 representatives in each of the six conditions.

Procedure

One week after the Baltic States presentation, students were placed in their assigned groups and each group was presented an economics lesson based on how industries compete and operate in the United States. A high school economics textbook authored by Coleman, Soens, and Fenton (1974) was used as a source for this lesson. Different competition systems were defined, including pure monopoly, oligopoly, monopolistic competition, and pure competition. Examples of each type of system were presented, as well as problems that were inherent to each particular system. Possible solutions to these problems also were discussed. Those students who were assigned to the oral reading condition were given a five-page typed copy of the economics lesson. The instructor read the lesson aloud while students followed on their copies. After this 15 to 16 minute oral presentation the students were allowed 15 minutes to read over portions of the lesson, to outline ideas presented in the lesson, or to otherwise assimilate information. The students who were assigned to the silent reading condition were given copies of the economics lesson and they were allowed 30 minutes to read and study the material presented in the lesson. One third of the students were presented a lesson with a mean commonality (the average of all values of B_1) of .60. This lesson is referred to as the "high commonality"lesson. One third of the students received the "medium commonality" lesson, with a mean commonality of .47. The remaining third of the students were presented the "low commonality" lesson, with a mean commonality of .35.

As mentioned previously, commonality measures the degree to which concepts are repeated from one sentence to the next in a lesson. As defined by Smith and Sanders (1981), a concept is a word or phrase that refers to a group of one or more things that have common characteristics. Thus, phrases such as "investments" and "customer service" are classified as concepts. However, such a definiton also indicates that phrases such as "brands of toothpaste" and "crops in Nebraska" are concepts. Therefore, as suggested by Anderson (1969), only key concepts (concepts that represent ideas that pertain to one or more of the lesson objectives) were used in the computation of each value of B_1. In the present study "investments" and "customer service" were classified as key concepts, but concepts such as "brands of toothpaste" and "crops in Nebraska" were not classified as key concepts, since the latter two concepts did not focus on any particular lesson objectives.

Table 1 shows corresponding excerpts from the high commonality lesson (mean B_1 value of .60), the medium commonality lesson (B_1 mean of .47), and the low commonality lesson (B_1 mean of .35). The key concepts for the three lessons, as well as the frequencies of occurrence of these concepts also are shown. The key concepts are numbered to facilitate identification, as well as computations.

Insert Table 1 about here

As can be seen in Table 1, 23 key concepts were focused on in each of the three lessons. The concepts occurred the same number of times in each lesson. The content covered was exactly the same for each lesson. Each lesson consisted of 50 statements. The only variation in the lessons

was the order in which the statements were presented. Care was taken in constructing the medium commonality lesson and the low commonality lesson so that the communication was logical. If concepts had not been introduced previously in a lesson, then such concepts were not referred to so that logical sequencing of communication was violated. For example, the excerpts in Table 1 begin with a discussion of monopolies. But the medium commonality excerpt and the low commonality excerpt both move on to discuss pure competition. Both the medium commonality lesson and the low commonality lesson had defined pure competition previously and had given examples of pure competition systems. The high commonality excerpt did not mention pure competition because the high commonality lesson completed the entire discussion of pure competition directly after pure competition was defined. Although students were familiar with some of the concepts presented in the lesson, none of the students had been presented information in previous classes about how industries compete and operate in different economic systems.

Referring to Table 1, the first segment of information in the high commonality excerpt discusses four key concepts (prices, pure monopoly, customer service, and competition), which are concepts 8, 10, 13, and 22 respectively. Segment B of this excerpt refers to six key concepts (products, prices, government, pure monopoly, customer service, and quality), which are concepts 5, 8, 9, 10, 13, and 16. Therefore, segments A and B have three key concepts in common (concepts 8, 10, and 13) and four key concepts that appear in one segment but not the other (concepts 5, 9, 16, and 22). As shown in Table 1, the value of B_1 for segments A and B is

$$\frac{2(n_1)}{n_o + 2(n_1)} = \frac{2(3)}{4 + 2(3)} = .60.$$

Similarly, in computing B_1 for segments B and C of the high commonality excerpt, these segments have six concepts in common and zero concepts that appear in one segment but not the other. Therefore, the B_1 value for segments B and C is $\frac{2(n_1)}{n_o + 2(n_1)} = \frac{2(6)}{0 + 2(6)} = 1.00.$

Readers who are not familiar with the commonality variable are encouraged to verify the computations for the remaining B_1 values shown in Table 1.

Immediately after each lesson was presented, student comprehension was determined by administering a 24-item multiple-choice test. The test focused on identifying necessary criteria for various free market systems, classifying various industries or businesses according to their respective competition systems, and on application of economic principles discussed in the lesson. The split-half reliability of this test was .82.

Results

A 3 (ability level: above average ability vs. average ability vs. below average ability) X 3 (commonality: high vs. medium vs. low) X 2 (method of reading presentation: oral vs. silent) analysis of variance was performed on the economics test scores. The means and standard deviations for each of the 18 groups are presented in Table 2. The summary table for the analysis of variance is shown in Table 3.

The main effect due to method of reading was significant, F (1, 264) = 9.0, $p < .01$, with scores of students who read silently

exceeding scores of students in the oral reading groups. As expected, the main effect due to ability level was significant, F (2, 264) = 90.8, $p < .0001$. Scheffé's specific comparison tests showed that the above average students scored significantly higher than the average students, and the average students scored significantly higher than the below average students.

The interaction between commonality and ability level also was significant, F (4, 264) = 3.6, $p < .01$. Scheffé's tests indicated that the average ability students in the high commonality condition and in the medium commonality condition scored significantly higher than below average students, regardless of the degree of commonality these below average students received. However, the average ability students in the low commonality condition did not score significantly higher than below average students in any of the commonality conditions. Furthermore, the above average students in the high commonality condition scored significantly higher than the average students in the low commonality condition, but the above average students in the medium commonality and low commonality conditions did not score significantly higher than the average students in any of the commonality conditions. Finally, Scheffé's tests revealed that the above average students scored significantly higher than the below average students, regardless of the commonality conditions. The analysis revealed no further significant main effects or interactions.

Insert Tables 2 and 3 about here

Discussion

The results of this study indicate that lesson commonality significantly affected student comprehension under certain student ability conditions. It appears that a high degree of commonality increases student comprehension under certain student ability conditions, and does not reduce comprehension under any such conditions.

Students comprehended significantly more of the lesson material when they read it silently than when the presentation was read aloud. Caution should be exercised when interpreting this result because students in the oral groups listened as the instructor read the material while these students followed along on their handouts. Results may have differed if each student had read the material aloud, rather than the teacher reading the lesson to the students. Bearing this caution in mind, Table 2 shows that, except for above average students in the high commonality condition, the group means of students in the oral reading conditions never exceeded the means of students in the corresponding silent reading conditions. Taylor and Samuels (1983) reported that elementary students learn more when they are presented material orally rather than when they read the material silently. The present study indicates that such results do not generalize to secondary school students.

Marshall and Glock (1979) indicated that the structure of text material affected college students differently, depending on the relative degrees of intelligence of these students. The present study also reveals a connection between student ability level and the organization of lesson material.

Two suggestions concerning commonality are offered to educators. First, this variable may provide an additional criterion for evaluation of textbooks and other educational materials. For example, readability formulas typically are used to determine reading levels of books. Commonality analysis would provide a measure of the degree to which such books are organized. The second suggestion is that teacher trainers and teacher assessors consider the commonality variable as a means of helping teachers organize lessons. Teachers who appear to be disorganized might improve by identifying the key concepts of their lessons and then sequencing their presentations so that higher degrees of commonality are achieved.

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Table 1.

Excerpts from High, Medium, and Low Commonality Lessons

Key Concepts and Frequencies of Occurrence

1. market (5)
2. industry (17)
3. pure competition (20)
4. criteria for pure competition (9)
5. producer, product, production (27)
6. consumer (3)
7. wheat (7)
8. prices (17)
9. government (11)
10. pure monopoly (10)
11. criteria for pure monopoly (4)
12. water company (1)
13. customer service (4)
14. oligopoly (18)
15. profit (3)
16. quality (of product) (8)
17. advertising (1)
18. barriers to new competitors (5)
19. investments (1)
20. natural resources (1)
21. patents (3)
22. competitors, competition (19)
23. monopolistic competition (2)

High Commonality Lesson	Key Concepts	B_1
A. One solution to the problems caused by pure monopolies is to introduce competition into the area, thus improving customer service and helping to control prices.	8, 10, 13, 22	—
B. Another solution to problems created by pure monopolies is to have the government regulate prices, also checking that the customer service and quality of products are acceptable.	5, 8, 9, 10, 13, 16	$\frac{2(3)}{4 + 2(3)} = .60$
C. Another solution to problems caused by pure monopolies is to have government ownership of monopolies, thus attempting to ensure that prices are fair, customer service is good, and quality of products is acceptable.	5, 8, 9, 10, 13, 16	$\frac{2(6)}{0 + 2(6)} = 1.00$

Table 1. (continued)

	Key Concepts	B_{-1}
D. Most industries fall between the two extremes of pure competition and pure monopoly; one such type of system is called an oligopoly.	2, 3, 10, 14	$\frac{2(1)}{8 + 2(1)} = .20$
E. Oligopolies are industries that have only a few competitors; each firm in an oligopoly turns out a product that is only slightly different from the products produced by competitors.	2, 5, 14, 22	$\frac{2(2)}{4 + 2(2)} = .50$
Medium Commonality Lesson		
A. One solution to the problems caused by pure monopolies is to introduce competition into the area, thus improving customer service and helping to control prices.	8, 10, 13, 22	—
B. One solution to problems of pure competition is to have the government buy and store surplus production when prices fall below a certain level.	3, 5, 8, 9	$\frac{2(1)}{6 + 2(1)} = .25$
C. Another solution to problems created by pure monopolies is to have the government regulate prices, also checking that the customer service and quality of products are acceptable.	5, 8, 9, 10, 13, 16	$\frac{2(3)}{4 + 2(3)} = .60$
D. Another solution to problems caused by pure monopolies is to have government ownership of monopolies, thus attempting to ensure that prices are fair, customer service is good, and quality of products is acceptable.	5, 8, 9, 10, 13, 16	$\frac{2(6)}{0 + 2(6)} = 1.00$
E. A further solution to pure competition problems is for the government to pay those in the industry to limit production, thus conserving resources.	2, 3, 5, 9	$\frac{2(2)}{6 + 2(2)} = .40$

Table 1. (continued)

Low Commonality Lesson		B_1
A. One solution to the problems caused by pure monopolies is to introduce competition into the area, thus improving customer service and helping to control prices.	8, 10, 13, 22	———
B. One solution to problems of pure competition is to have the government buy and store surplus production when prices fall below a certain level.	3, 5, 8, 9	$\frac{2(1)}{6 + 2(1)} = .25$
C. Another solution to problems created by pure monopolies is to have the government regulate prices, also checking that the customer service and quality of products are acceptable.	5, 8, 9, 10, 13, 16	$\frac{2(3)}{4 + 2(3)} = .60$
D. A further solution to pure competition problems is for the government to pay those in the industry to limit production, thus conserving resources.	2, 3, 5, 9	$\frac{2(2)}{6 + 2(2)} = .40$
E. Another solution to problems caused by pure monopolies is to have government ownership of monopolies, thus attempting to ensure that prices are fair, customer service is good, and quality of products is acceptable	5, 8, 9, 10, 13, 16	$\frac{2(2)}{6 + 2(2)} = .40$

Table 2.

Group Means and Standard Deviations

	Degree of Commonality					
	High		Medium		Low	
	Oral	Silent	Oral	Silent	Oral	Silent
High Ability	$\bar{x}$ = 17.9 sd = 3.8 n = 14	$\bar{x}$ = 16.7 sd = 4.7 n = 14	$\bar{x}$ = 14.8 sd = 4.5 n = 14	$\bar{x}$ = 14.9 sd = 4.0 n = 14	$\bar{x}$ = 13.6 sd = 3.7 n = 14	$\bar{x}$ = 16.3 sd = 3.8 n = 14
Average Ability	$\bar{x}$ = 12.5 sd = 3.7 n = 14	$\bar{x}$ = 14.4 sd = 3.1 n = 14	$\bar{x}$ = 11.8 sd = 3.8 n = 14	$\bar{x}$ = 14.7 sd = 3.8 n = 14	$\bar{x}$ = 8.9 sd = 4.5 n = 14	$\bar{x}$ = 12.6 sd = 3.8 n = 14
Low Ability	$\bar{x}$ = 8.0 sd = 3.1 n = 19	$\bar{x}$ = 8.4 sd = 3.1 n = 19	$\bar{x}$ = 8.4 sd = 4.2 n = 19	$\bar{x}$ = 8.4 sd = 2.4 n = 19	$\bar{x}$ = 8.2 sd = 2.8 n = 19	$\bar{x}$ = 10.2 sd = 3.9 n = 19

Table 3.

Results of Analysis of Variance

Source	df	SS	MS	F	P
Commonality (A)	2	56.2	28.1	2.1	n.s.
Method (B)	1	122.7	122.7	9.0	.005
Ability Level (C)	2	2487.4	1243.7	90.8	.0001
AB	2	71.3	35.7	2.6	n.s.
AC	4	198.7	49.7	3.6	.01
BC	2	69.7	34.9	2.5	n.s.
ABC	4	15.6	3.9	0.3	n.s.
Error	264	3615.8	13.7		
Total	281	6637.4			